

DEVELOPMENT OF INNOVATIVE APPROACHES AND METHODS FOR TEACHING JAPANESE AT THE ELEMENTARY LEVEL USING ARTIFICIAL INTELLIGENCE AT TSUOS (SUGGESTIONS AND EXAMPLES)



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Abstract. *Today, with a rapid development, serious attention is paid to the use of artificial intelligence (AI) in the field of learning foreign languages. This article discusses the motivation and level of interest of Japanese language learners using artificial intelligence, and the innovative approaches and methods of teaching Japanese at an elementary level. One of the basic principles of effective study of foreign languages is to maintain a high level of student activity as well as a harmonious combination of internal and external motivation. The article covers the initial study of Japanese using artificial intelligence as well as the opportunities available through computers and smartphones. By adapting artificial intelligence tools to the different learning needs of students, more individual and interesting methods of learning a foreign language have been recommended and highlighted, in particular, as an example of learning Japanese. In addition, practical recommendations have been made for teachers and students on how to optimally use artificial intelligence tools in language education. These recommendations aim to eliminate the gap between technology and traditional methods of language teaching, to offer a more comprehensive and effective approach to foreign language learning.*

Key words: *AI, NLP, DL, Japanese language, innovative apps, teaching methods, traditional teaching, immersive learning.*

President Of The Republic Of Uzbekistan Sh. M. Mirziyoyev's Decree No. 6079 dated October 5, 2020 "on the approval of the strategy" [6] digital Uzbekistan-2030"and measures to effectively implement it "and Resolution No. 4996"on measures to create conditions for the rapid introduction of artificial intelligence technologies» [5] of February 17, 2021 made it possible to put work in this area into one system and organize. In particular, the" program of measures to improve the position of the Republic of Uzbekistan in the index of readiness for artificial intelligence was approved. In it, special attention is paid to the development and use of Cytechnologies in the economic sectors and the social sphere, in the public administration system, the introduction of these technologies in the fields of Agriculture, Energy, Health, and e-government.

In recent years, interest in artificial intelligence has increased significantly in the Republic. Various teams are organized, training courses are opened and conferences are held. The goal is to increase the awareness and interest of the population about AI. The state actively supports the development of this area. For

example, the biometric identification system helps to remotely identify customers of different companies. In addition, highly specialized startups are actively developing in Uzbekistan in such areas of artificial intelligence as the creation of large language models aimed at the Uzbek language, as well as speech recognition and synthesis tools in the state language. In Uzbekistan, the number of people interested in obtaining education and finding work related to artificial intelligence is growing. This trend is felt in the recruitment process, which is regularly replenished in the Alif artificial intelligence community in Uzbekistan.

Japanese (日本語, nihongo) is one of the East Asian languages spoken by over 120 million people, predominantly in Japan, where it is the official language. The origin of the language remains largely unexplored and is still a mystery. However, experts identify two lexical layers in the language: Austronesian and Altaic, although neither has gained widespread acceptance. This language ranks among the top ten languages in the world by the number of native speakers, occupying the 9th position.

The Japanese language possesses a unique writing system, which includes both syllabic writing and ideography. It is known by two names: nihongo (日本語 — Japanese language) and kokugo (国語 — national language).

Logographic writing of Japanese language conveys the meaning of the words represented, but the specific pronunciation associated with each character, which is essentially a pictorial symbol, is not inherently linked. In all regions of China, similar characters are used, with nearly the same meaning, but their pronunciation can differ so greatly that people from one part of China may not understand those from another region; this phenomenon is also characteristic of Japan.

Logographic writing is very complex (though very beautiful and interesting!). In the Japanese language, almost all kanji characters have more than one pronunciation, depending on the words and combinations in which they appear. To become literate, an individual must learn a large number of complex characters.

The Japanese language has three writing systems. Many beginners make the common mistake of referring to the syllabaries as kanji, though they are, in fact, entirely different systems. Historically, Japan used two syllabic alphabets: hiragana and katakana. These coexisted with kanji, which are logographic characters borrowed from China.

Thousands of years ago, the Japanese had a spoken language but no writing system. To address this, they adopted the writing system from their neighboring country, China. Chinese characters are ideograms that represent the meaning of words. Phonetically, each character corresponds to a syllable. The Japanese, however, decided to use the phonetic value of the characters without regard to their meanings. In other words, Japanese words began to be written using kanji that matched the phonetic sounds. Later, Buddhist monks devised the syllabaries as a simplified way to read and write kanji.

The Japanese alphabets (and writing in general) were divided by gender. Learning Chinese characters was accessible to only a limited portion of the male population. Hiragana was primarily used by women, while katakana was predominantly used by men. The two alphabets differ in that hiragana characters have smoother outlines, while katakana characters are more angular.

Although hiragana was considered the "female" alphabet, not all women learned it—only those close to the imperial court or from the higher social classes. Katakana, on the other hand, was used by men as a shorthand system and later became used to write the grammatical elements of words.

Features of the Japanese Language

Logographic languages are inherently complex because both spoken language and writing must be learned separately. Japanese employs three writing systems. Two of these, hiragana and katakana, are syllabic alphabets. Hiragana is used to express grammatical relationships between words, whereas katakana is reserved for the transcription of foreign and borrowed words. Kanji, which are logographic characters derived from Chinese, represent the core meaning of a word. If the appropriate kanji for a word is forgotten, hiragana can be used as an alternative.

Word Order in Japanese Sentences

The word order in Japanese sentences does not present significant complexities. One simply needs to remember that the predicate always appears at the end of the sentence, while modifiers precede the noun they modify. Additionally, the subject may be omitted when it is clear from the context who or what is being discussed.

Features of the Japanese Language

When learning Japanese, there is no need to memorize various word forms, as words do not change according to person, gender, or number. The plural form is indicated by a particle attached to the word at the end. Additionally, Japanese does not have a future tense. Another unique feature is the three levels of politeness in conversation: casual communication (informal "you"), speech for official occasions (formal "you"), and respectful language. As for phonetics, the sounds of Japanese speech are similar to Russian, with some nuances. From the above, it is clear that the most challenging aspect of learning Japanese is its writing system.

Methods of Learning Japanese

There are various approaches to learning the Japanese language: independently, in group classes, or through one-on-one lessons with an instructor. The choice of method is a personal decision, as motivation is the crucial factor in language acquisition. With adequate motivation, any of these methods can yield successful results.

Group Classes

In large cities, it is possible to find linguistic centers or schools that offer Japanese language courses from the very beginning in group settings. Teachers in these centers are typically not only proficient in the language but also skilled in

effective memory techniques for word acquisition. Experienced instructors can make the learning process dynamic and engaging. However, it is important to note that if rapid language acquisition is the goal, time outside of class must also be dedicated to memorizing and practicing kanji, completing exercises, and repeating phrases and words. A drawback of group classes is the variation in students' language proficiency and learning speeds. Even if you progress faster than others, you will still need to adjust to their pace.

Individual Lessons

Unlike group classes, individual lessons allow students to learn at their own pace. The instructor can tailor the lessons specifically to the individual's needs. Additionally, the frequency of lessons can be adjusted according to the learner's requirements. This method is ideal if not for the high cost of one-on-one lessons.

Self-Study

The advantage of self-study is that it requires no financial investment, and the schedule is entirely dependent on the learner's own commitment. However, it is important to recognize that self-study can lead to complacency, and the learning process may become prolonged. The initial step is to learn the syllabic alphabets, which consist of 146 syllables, followed by learning kanji and grammar. To communicate fluently in Japanese, it is necessary to know approximately 2,000 kanji characters. Memorizing such a large number of characters can be challenging, so many teachers recommend using mnemonic techniques to aid retention.

Tips for Self-Study Learners

Language acquisition is a lengthy process, and it is important to ensure that it remains engaging and effective. The following recommendations can aid in maintaining both interest and effectiveness:

- Study every day! Languages with a logographic writing system are easily forgotten, so it is crucial to avoid taking extended breaks.
- Diversify your activities. For instance, practice writing kanji characters in a notebook in the morning, watch a Japanese film with subtitles after lunch, or listen to Japanese music. In the evening, try reading news articles on Japanese websites. Any method can contribute to language learning.
- For smartphone users, numerous apps are available to make learning more enjoyable. These apps include kanji practice, listening exercises, pronunciation checks, and dialogues. This method is particularly beneficial for those with limited time, as it requires only around five minutes a day. The key to success with this approach is consistency.
- For memorizing kanji, apps such as Ankidroid allow users to upload flashcard decks. By reviewing these flashcards daily, you can monitor the retention rate for each kanji, and the app will adjust the frequency of their review accordingly.
- Learn vocabulary not in isolation but as part of phrases or sentences. Associating a word with multiple phrases makes it easier to remember.

- If possible, engage in conversation with a native speaker, either in person or via Skype. This helps develop spontaneity and solidifies your knowledge.
- The most effective method would be immersion, by living in a country where the language is spoken.

Learning Japanese is a challenging but entirely achievable task. The two key components for successful language acquisition are strong motivation and discipline. With many available methods for learning the language, the best results can be attained by combining all these approaches.

Artificial intelligence is a field of Science and technology focused on creating machines capable of imitating human intelligence, relying on disciplines such as mathematics, psychology, linguistics, philosophy, neuroscience, and informatics. Mathematics, especially Statistics, provides the basis for algorithms in machine learning. Psychology and neurology contribute to the understanding and modeling of human knowledge and brain activity, enlivening AI models such as neural networks. Linguistics, on the other hand, plays a decisive role in natural language processing (NLP), a branch of artificial intelligence focused on language comprehension and creation. Below we list the main AI systems for learning a foreign language:

1. Natural Language Processing (NLP) is a human language related to AI and Linguistics and automated processing in general. It focuses on the creation and analysis of written and oral language. Intelligent language tutoring systems (ILTS) deal with aspects of lexical, morphological, and syntactic language, as well as aspects of meaning, speech, and attitude beyond these to the linguistic context [9; 817-831-p.]. NLP is a subset of artificial intelligence that allows computers and machines to understand, interpret, manipulate, and communicate human language.

2. Deep learning (DL) is a subfield of artificial intelligence that uses artificial neural networks (computational systems similar to the specific neural networks of the human brain) designed to study a wide range of data [11; 85-117-p.]. Deep learning (deep learning), which involves multilayer neural networks, has led to advances in areas such as image and speech recognition.

Language learning is a complex process that covers various cognitive, emotional and motivational factors. In recent years, AI has emerged as a transformative focus in the education system, offering new opportunities to attract and motivate foreign language learners to acquire new knowledge and skills. Many studies show the positive impact of AI on education, focusing on the experience of learning an individual approach (personalization). AI-led curricula can approach each student individually to meet their specific needs and interests. This flexibility is important in improving educational outcomes. NLP is used in voice assistants (such as Alice), automatic translation (Google Translate), and chatbots. It combines technology and language to make it easier for computers to communicate with humans. Imagine that you are teaching the computer to recognize a cat in photos. Each layer of the neural network can learn something different: one layer

learns to recognize edges, another learns to recognize shapes, another learns to recognize textures, etc. As the information passes through each layer, the network studies more detailed and complex features until it is able to determine if there is a cat in the picture. Deep learning is used in many areas for voice recognition (e.g., in smart assistants), image recognition (e.g., like a phone camera), and even self-guided cars to recognize objects and people on the road. It can learn directly from large amounts of data, improving the more information it receives. He conducted a number of studies in the field of G. Absalamova [1; 106–116-p.], O. Eshboyev [4; 612–615-p.], O. Bobokulova [2; 210–213-p.] emphasizes the importance of digital technologies in teaching foreign languages, saying that it is necessary to integrate technology into the teaching process in order to improve the effectiveness of the lesson.

Today, AI is widely used in the study of many foreign languages, including Japanese. Japanese is distinguished from many other languages by its complex grammar, wide vocabulary and unique pronunciation. AI simplified the complex grammatical rules of the Japanese language for a while. For example, ChatGPT has brought elementary Japanese grammar rules to a level that even a 5-year old can understand. One of AI's most important advantages in language learning is its ability to teach vocabulary in context. This approach is different from the traditional method of memorization, which can be boring and ineffective. AI tools provide new words within phrases and conversations to help students better understand and remember them in life situations.

Many students have achieved success in learning Japanese using AI tools. These tools not only improve the ability to talk, but also provide insight into Japanese culture and dialects, prepare students for real-world influence, and enhance communication in a variety of contexts. However, AI tools like ChatGPT may not always provide 100% accurate information, especially in a more complex language such as Japanese. Therefore, it became very important to use these tools wisely and supplement them with other reliable learning resources. Success increases when the language acquired in the traditional way is strengthened through AI. At this point, let's introduce you to the 3 best AI apps designed to learn Japanese:

1. Japanese Language Coach. This AI-powered program offers personalized learning experiences by adapting to each user's specific learning style through appropriate guidelines, exercises, and quizzes. It emphasizes the vital context and provides sample sentences for practical use of language. Interactive quizzes vary their difficulty depending on your performance, allowing for an interesting learning experience. The app also offers extensive breaches of Japanese sentence structure to better understand grammar and vocabulary. Tips for maximizing learning: it is recommended to practice regularly, with the application designed to fit busy schedules. As part of the training process, taking mistakes, actively listening to Japanese audio content, and speaking out loud to improve pronunciation are recommended for effective learning.

2. **Duolingo.** Duolingo offers a gamified and intuitive approach to learning Japanese. It is ideal for beginners and focuses on teaching through immersion, similar to how a child learns a language. The lessons are based on pictures and intuitive learning, with game-like features to motivate and engage users. It covers writing systems, pronunciation, vocabulary, and sentence structure through short, manageable lessons. Duolingo is suited for learning Japanese words, Hiragana, Katakana, and Kanji.

3. **FluentU.** FluentU is an immersive learning app that uses real-world videos, turning them into language learning lessons. This approach provides a natural and engaging way to learn Japanese. The app adapts to your specific needs, ensuring active practice of newly learned language skills. These apps each offer unique approaches to learning Japanese, leveraging AI and interactive learning methods. Whether you prefer structured courses, immersive learning, personalized paths, or quick daily lessons, there's an app suited to your learning style and schedule.

In the age of technology, language learners, especially many adolescents, are using various gadgets and applications and applications in it with great interest. Therefore, today a modern foreign language teacher can know the opportunities that modern technologies are creating and use it effectively in drawing up lesson materials and increasing the activity of students in the lesson. With the new technologies AI offers, there are great opportunities that encourage young language learners who are coming of age in the age of technology to engage in reading. One of the most important advantages of using AI in language learning is its individual approach based on each student's need. AI platforms can collect and analyze information about the student's strengths and weaknesses, allowing for a more targeted approach to Language Teaching. For example, a number of AI-controlled language training programs (Duolingo, Rosetta, Stone, Babbel, Lingodeer, Pronunciator) can evaluate a student's speech, provide quick feedback on pronunciation, intonation, and rhythm. This feedback helps students improve their speech skills faster and more accurately than traditional methods. In addition, AI can adapt to the learning style that the student likes. Each student has their own learning method and AI takes this into account when providing a personalized learning experience [10; 148–151-p.]. If the student responds better to visual materials, AI will create learning materials and training accordingly [12]. For example, AI-based platforms such as Duolingo and Rosetta Stone teach a foreign language with an individual approach to the level, interests and goals of students [3; 775–779-p.]. AI-based applications such as HelloTalk and Tandem allow readers to interact with other readers from around the world, sharing ideas about cultures . AI-based chatbots like replica and ChatGPT can have natural and fun conversations with readers and provide them with instant and constructive feedback [8; 436–464-p.].

2024 - year and came to many free applications have been created which teach the japanese language, these are: Japan-日本語 GPT-tool advanced japanese

ai SAKURA-Anima-Focused AI Assistant, the sense of jlpt master-JLPT prep and Practice, 日本語語彙クイズボット-we are rid of japanese vocabulary Tool オタクガール-father what culture chat ai, 康娜-Charming companion ai nihon cargo sense-anima [7] forward with learning japanese can be an example to the world.

In addition, AI-based analysis provides teachers with insights into student performance and activity levels, enabling them to make informed decisions to optimize teaching strategies. The gameplay elements and interactive content created at AI can make the learning process more interesting and viable, increasing student activity and motivation. AI technologies allow students to access educational content at any time and anywhere, eliminating the limitations of a traditional classroom class. This flexibility allows for continuous learning as well as practice, which is very important for language acquisition. This information helps teachers adjust their guidelines and identify areas where students need additional support. AI can provide feedback (feedback) to the assessment and the student's creative work. It can assess oral and written language skills, make corrections, and make suggestions for improvement. This, in its place, slightly relieves the work of the teacher and can provide practical support to young teachers. It can also make learning Japanese more fun and increase student motivation by using AI game elements. AI can adapt these elements to individual student preferences and encourage continued participation. AI's integration with gamification in education not only offers a new approach to teaching and learning, but also requires careful consideration of its effects.

Innovative teaching methods aren't just about using the most cutting-edge technology in class or constantly catching up with the latest education trends, using new teaching strategies that focus more on students. These innovative methods encourage students to join proactively and interact with their classmates and you the teacher during lessons. Unlike traditional teaching, which mainly focuses on how much knowledge you can pass on to your students, innovative ways of teaching dig deep into what students truly take away from what you're teaching during lectures.

Innovative teaching methods aren't just about using the most cutting-edge technology in class or constantly catching up with the latest education trends, these are the teaching-learning methods. They're all about using new teaching strategies that focus more on students. These innovative ones encourage students to join proactively and interact with their classmates and you - the teacher - during lessons. Students will have to work more, but in a way that meets their needs better and can help them grow faster. Unlike traditional teaching, which mainly focuses on how much knowledge you can pass on to your students, innovative ways of teaching dig deep into what students truly take away from what you're teaching during lectures.

In 2021:

- **57%** of all US students had their digital tools.
- **75%** of US schools had the plan to go virtual entirely.

- Education platforms took up **40%** of student device usage.
- The use of remote management apps for educational purposes increased by **87%**.
- There is an increase of **141%** in the use of collaboration apps.
- **80%** of schools and universities in the US had bought or tended to buy additional technology tools for students.

By the end of 2020:

- **98%** of universities had their classes taught online.

Artificial intelligence also has disadvantages.:

It will not replace communication with a real person. AI often adapts to the human level, uses the same words and phrases, which reduces the effectiveness of communication. Also, neural networks are not able to convey lively intonations in a conversation, and they often do not understand cultural aspects. You can train with AI, but you should not rely on the depth of communication.

May make mistakes. Sometimes users catch neural networks making mistakes: incorrect use of a word, incorrect explanation of a rule, illiterate sentence, etc. In most cases, artificial intelligence writes correctly, but it is worth remembering that there may be flaws. It won't help you improve your pronunciation. You can voice the text in neural networks, listen to it and repeat it after the speaker. However, artificial intelligence won't check how well you speak, it needs a human to do it.

Learning experience for students and teachers when artificial intelligence and education come together changes. Students adapt to personalization, quick feedback and their requirements develops with Language learning like language bots, machine translation and customized textbooks artificial intelligence technologies. It is clear that such means language it can be of great help to learners to know the language perfectly, especially traditional when used in conjunction with learning methods. Students use one technique from another do not have to choose, instead, they have the most comprehensive language curriculum for themselves with many alternatives available to create their favorite mix ways.

Training teachers for the rational use of AI and support is essential. Use of teachers AI tools the goal is for them to participate in trainings and receive constant support according to. This is an effective integration of their teaching practice and sufficient knowledge to overcome any problems and indicates that they have the skill. Correct guidance and creativity of the teacher discover new aspects of foreign language education in technology tools makes the ground for making. When the AI is properly applied, the educational experience is enriching, bringing students' motivation and curiosity to new heights can be an effective assistant at the output. Also Foreign through the use of AI gamification elements to make learning the language more interesting, and the motivation of students can increase. AI these elements are the individual of the readers adapt to their preferences and encourage constant participation can. AI's integration with gaming in education is not only offers a new approach to teaching and learning, but rather

its it also requires careful consideration of the effect. The teachers are their critical exploration of Technology, their potential they need to understand the advantages and limitations.

The use of AI in the process of learning a foreign language in practice has confirmed its absolute effectiveness. The thoughtful and appropriate implementation of AI in language training programs ensures significant progress. At the same time, the participation of experts, including linguists, teachers and native speakers, is crucial for the development and implementation of AI-based language courses.

More and more language platforms and applications are using artificial intelligence to improve the learning process and help users achieve results faster. However, there are difficulties and mistakes here too. Some programs use only AI and do not involve live teachers, while a number of other developers still refuse to implement relevant technologies. But a balance is important: implementing AI requires a carefully thought-out strategy and a clear sequence of actions.

In conclusion, AI's education in a foreign language integration has changed the traditional classroom environment to include interactive, cultural rich in terms and offers a collaborative learning experience. As technology continues to evolve, it was created using AI these environments become more complex and collaborative language learning further increases the efficiency.

List of used literature

1. Absalamova G. S. Xorijiy tillarni o'qitishda raqamli texnologiyalarning ahamiyati // Academic Research in Educational Sciences: volume 4 (SamTSAU Conference 1). — Samarkand, 2023. — P. 106–116.
2. Babaqulova O., Umarova E. H., Xudayberdiyeva S. O. Xorijiy tillarni o'qitishda zamonaviy texnologiyalarning o'rni va ahamiyati // Yangi O'zbekistonda tabiiy va ijtimoiy-gumanitar fanlar respublika ilmiy amaliy konferensiyasi. — 2023. — № 1(8). — P. 210–213.
3. Chebotareva I. N., Lyaskovets A. V., Makhova V. V. Pros and cons of using gamification in the Russian educational system // materials of the 6th International Conference on social sciences and higher education 2020 (ICSSHE 2020). Atlantis Press, 2020. — P. 775–779. <https://doi.org/10.2991/assehr.k.201214.148>
4. Eshbayev O., Rakhimova S., Samandarova N. A systemic mapping study of Mobile Assisted Language Learning methods and practices: a qualitative literature review // Proceedings of the 6th International Conference on Future networks & distributed systems. — 2022. — P. 612–615. <https://doi.org/10.1145/3584202.3584294>
5. <https://lex.uz/docs/-5297046>
6. <https://uzdon.uz/uz/news/info/uzbekistan/165/>
7. <https://www.yeschat.ai/tag/Japanese-Learning>
8. Liu S.H., et al. Computer Assisted Language Learning, 2019, No 32 (5-6), pp. 436–464.

9. Meurers, Detmar. «Natural Language Processing and Language Learning» The Concise Encyclopedia of Applied Linguistics. Ed. Carol A. Chapell. Chichester: Wiley, 2020. 817-831.
10. Mukhiddinova O. The role of artificial intelligence in the study of foreign languages // Journal of new Century Innovations. — 2023. — № 25(1). — P.148–151.
11. Schmidhuber, Jürgen. «Deep learning in neural networks: An overview» Neural Networks 61.117 (2015): 85-117. DOI: 10.1016/j.neunet.2014.09.003.
12. UNESCO. (2019). Digital library, artificial intelligence in education: challenges and opportunities for Sustainable Development. - URL: <https://unesdoc.unesco.org/ark:/48223/pf0000366994.locale=ru>

